

2-16-1990

Maine Works Jobs for Your Future ITV Resource Packet: The Environment

Maine Occupational Information Coordinating Committee

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Recommended Citation

Maine Occupational Information Coordinating Committee, "Maine Works Jobs for Your Future ITV Resource Packet: The Environment" (1990). *Employment Services Documents*. 114.
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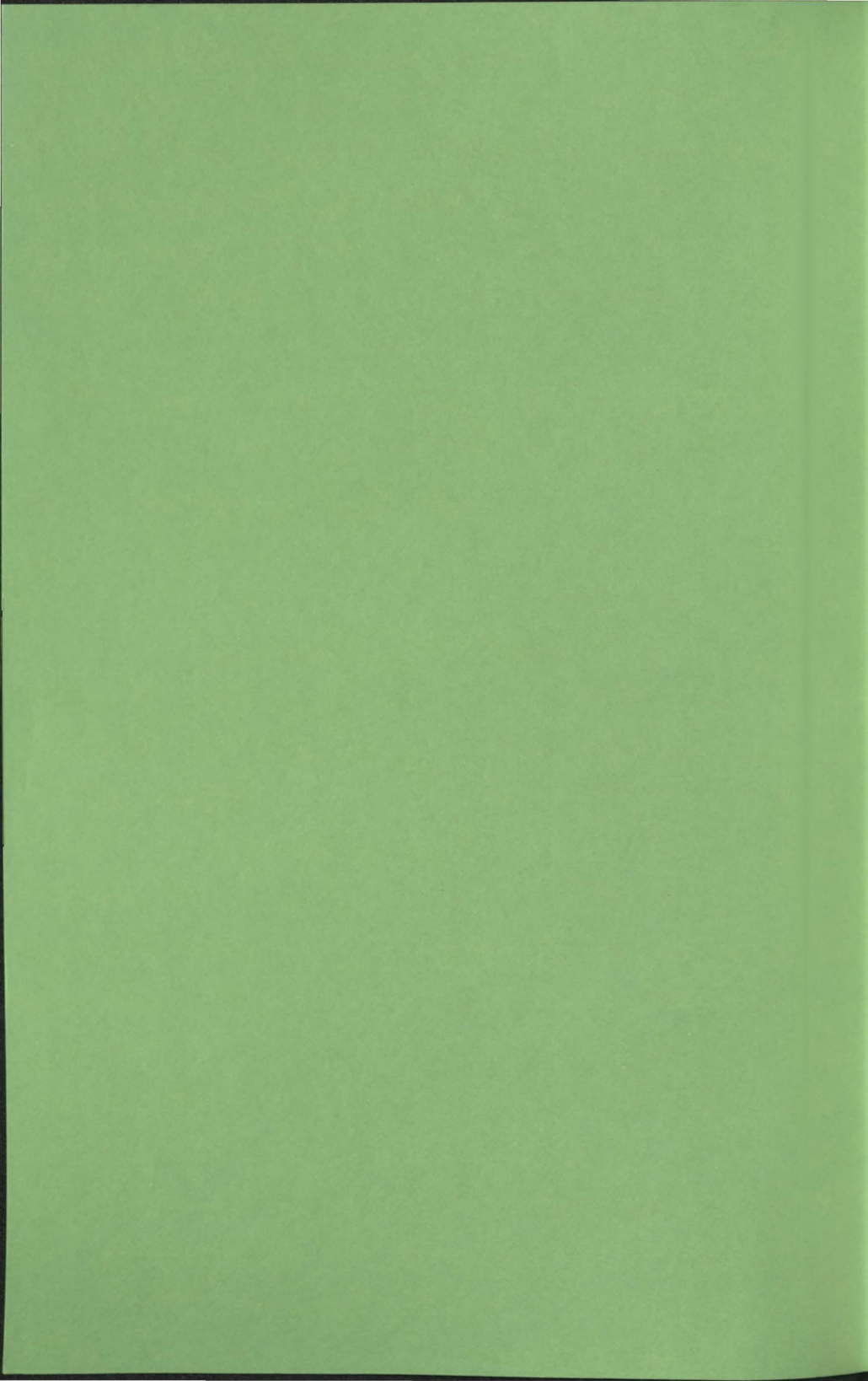
Jobs for Your
Future

ITV Resource
Packet

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INTRODUCTION

This brochure is presented as part of Governor McKernan's interactive television (ITV) series called MAINE WORKS. The subject of the fourth program is environmental careers.

Quality of life issues are important to Maine people. To ensure that we protect our environment, yet at the same time form paths for future economic benefits, we must find dedicated and knowledgeable individuals who possess the vision and caring to achieve the fragile balance that must exist between the people of Maine and nature.

This booklet is divided into three sections.

Section I presents a listing of findings from the publication, *Maine at the Millennium*, published by the Commission on Maine's Future. This section depicts concerns Maine people have for the environment in which they live.

Section II presents a sampling of occupational profiles of positions in state government and private industry that relate to the environment.

Section III presents a checklist of personal characteristics that individuals typically possess who work in environmentally related occupations.

For more information, contact your guidance counselor.

MAINE TODAY: THE ENVIRONMENT

Findings from MAINE AT THE MILLENNIUM, The Commission on Maine's Future, 1989

- Maine has made major advances in improving air and water quality.
- Non-industrial sources of pollution continue to threaten environmental quality.
- The natural characteristics that define Maine's rural character are eroding gradually.
- Pollution from poorly planned uses is now of great concern.
- As a consumptive, "throw-away" society we have not established an effective system for disposing of solid wastes.
- Much of Maine's transportation, water supply, pollution treatment and waste disposal facilities are ravaged by age, overused and undermaintained.
- Four Mainers in five agree that natural beauty of Maine should be preserved, even if it means spending more public money or interfering with private investment decisions.
- The number of people enjoying the outdoors has increased substantially but places traditionally used by people are increasingly being closed off or lost to development.
- Mainers are ambivalent about the issue of public access to land and the protection of landowners' rights depending on the nature and ownership of the property involved.

ENVIRONMENTAL OCCUPATIONS

DIVERSE OPPORTUNITIES FOR CAREER PLANNING

Career planners are entering a time in our society that promises great changes in our occupational structure. Occupations that have traditionally existed may disappear and new occupations will emerge for consideration. Limiting our vision to what has been or focusing our perspective through a narrow mind set will create barriers to future life work possibilities. As we view our future alternatives, we seek to define our personal fit into the work world.

One future consideration for work that allows for diverse educational and training preparation and opportunities within private, nonprofit and public work settings is the field of environmental careers.

In Maine opportunities exist within state government, private industry, the university system, cooperative extension, private consulting and nonprofit agencies. Nationally, similar opportunities can be found in most states, the federal government and many industries.

The following occupational descriptions are representative of environmental careers that can be found in a variety of work settings. If you find these occupations of interest, you are encouraged to explore these occupations in greater detail with assistance from your family or school guidance counselor.

ENVIRONMENTAL CAREERS IN STATE GOVERNMENT: SOME OCCUPATIONAL PROFILES

The following are excerpts from personnel bulletins in Maine State Government for positions within the Department of Environmental Protection.

BIOLOGIST I (Wildlife)

SCOPE OF WORK: This is professional biological science work in planning, implementing and directing a variety of laboratory and field research and/or management projects for the conservation, protection and restoration of wildlife.

TYPICAL DUTIES:

- Develops, reviews and implements annual and long range management plans to support goals and objectives of the department.
- Collects, analyzes, evaluates and applies technical data from surveys, inventories, censuses, research and environmental impact investigations in order to assist in the development of various programs.
- Creates, oversees, monitors and maintains habitats for wildlife according to management plans.
- Represents the department in public and private meetings or hearings.

OIL AND HAZARDOUS MATERIALS SPECIALIST II

SCOPE OF WORK: Acts as team leader of field response team in responding to oil and hazardous materials spills and incidents. Oversees equipment maintenance needs of field office and coordinates unit training programs.

TYPICAL DUTIES:

- Coordinates equipment maintenance program to ensure equipment is functional when needed for field response activities.
- Develops technical and safety oriented information in order to provide appropriate safety and environmental advice to persons involved in the response to a discharge of oil and hazardous materials.
- Participates in off-hour spill response standby duty in order to ensure statewide, 24-hour, 7 days per week response capability.
- Directs cleanup of and ensures proper disposal of discharges of oil and hazardous materials in order to reduce environmental damages resulting from these discharges.
- Recovers State expended spill cleanup costs from responsible parties as required by law.

ENVIRONMENTAL SPECIALIST II

SCOPE OF WORK: This is professional work promoting and enforcing environmental laws and regulations through on-site inspection.

TYPICAL DUTIES:

- Evaluates environmental impact of land, air and water projects and clean-up activities.
- Investigates complaints of land, air and water pollution.
- Performs on-site monitoring and sampling to determine environmental quality.
- Provides technical advice to industries and the public.
- Drafts, negotiates and presents permits, licenses, consent agreements, financial settlements and associated documents.
- Writes and presents media releases, position papers and informational reports.
- Testifies on behalf of the State as an expert witness in court.

GEOLOGIST

SCOPE OF WORK: This is professional geological work involving the investigation of the composition, structure, physical and biological history of the earth's crust. Duties include analyzing geologic data, preparing and publishing findings and recommendations.

TYPICAL DUTIES:

- Plans, conducts, performs subsurface investigation to determine subsurface conditions at a proposed construction or disposal site.
- Reviews, researches, and verifies applications to determine adequacy of site to minimize environmental and ground water contamination.
- Investigates sites of known or suspected contamination of land or water using geophysical or geochemical techniques.
- Investigates the impact of acidic precipitation on aquatic ecosystems.

The following are excerpts from personnel bulletins in the Maine State Government for positions within the Department of Agriculture.

SOIL SCIENTIST

SCOPE OF WORK: This is professional geological soil science work in the investigation and study of soils including the physical, chemical and biological properties.

TYPICAL DUTIES:

- Conducts detailed field investigations of soil conditions.
- Consults with soil and water conservation districts and governmental agencies on soil survey needs.
- Reviews all LURC, DEP, IF & W and SPO A-95 applications for effect on soil and water resources of Maine.
- Travels throughout the State of Maine to meet with groups to carry out soil programs and assist landowners with problems.
- Serves as Co-chairman of the State Board of Certification for Geologist and Soil Scientists.

PESTICIDE CONTROL TECHNICIAN

SCOPE OF WORK: This is technical services work in conducting field activities in agricultural and forestry pesticide inspections.

TYPICAL DUTIES:

- Inspects and observes pesticide mixing, loading, application and disposal practices, records, and facilities in order to determine use/misuse of applicators.
- Interviews complainants and gathers evidence in order to determine the extent of pesticide violators.
- Recommends enforcement actions to supervisor in order to initiate appropriate penalties against violators.
- Answers questions of applicators, company officials, and the general public in order to provide assistance.

PRIVATE SECTOR OCCUPATIONS RELATING TO THE ENVIRONMENT

FORESTER:

Foresters locate and evaluate timber stands for harvesting. They determine the silvicultural activities necessary to meet harvest objectives and carry out those activities. Time is spent preparing and monitoring timber harvests according to specific silvicultural objectives, environmental guidelines and contractual compliance. Foresters maintain records, check scales, and participate in overall company security programs.

UNIT FORESTER:

Unit Foresters are responsible for all forest management activities within a specified area. As managers, they must maximize both the economic and the environmental goals of our forests. One key is the implementation and management of large stumpage sales operations. Related issues include environmental considerations, expenses, spruce budworm management, and road construction and maintenance. Other responsibilities which at times take significant effort are recreational programs, maple sugar production and gravel sales.

MANAGER OF FOREST MANAGEMENT:

The Manager of Forest Management coordinates the management and policies of environment, land use, wildlife, fisheries, and recreation. This manager serves as an environmental liaison with State and federal agencies, conservation groups, sportsmen, and other users. An additional responsibility is the administration of income to the company from recreational use of company lands.

OCCUPATIONS RELATING TO AGRICULTURE

Plant Physiologist • Agricultural Ecologist • Food Scientist • Soil Scientist • Veterinarian • Marketing Manager • Teacher • Agricultural Engineer • Food Broker • Environmental Scientist • Credit Analyst • Paper Chemist • Plant Pathologist • Urban Forester • Marine Scientist • Weed Scientist • Range Manager • Nematologist • Fisheries Scientist • Agronomist • Extension Specialist • Botanist • Climatologist • Soil Conservationist • Park Manager • Pest Control Specialist • Biometrician • Wildlife Biologist • Turf Specialist • Food Processing Engineer • Wood Scientist • Lawn and Garden Writer • Hydrologist • Reproductive Physiologist • Consultant • Molecular Biologist • Water Scientist • Agribusiness Manager • Nutritionist • Naturalist • Land Use Planner • Toxicologist • Farm Manager • Biochemist • Horticulturist • Food Inspector • Forester • Aquaculturist • Zoologist • Animal Nutritionist • Food Plant Manager • Landscape Contractor • Entomologist • Grain Merchandiser • Farmer/Rancher • Animal Physiologist • Livestock Buyer • Greenhouse Manager • Microbiologist • Agricultural Attache • Landscape Architect • Nursery Manager • Arborist • Parasitologist • Logging Engineer • Herd Manager • Geneticist

To learn more about these occupations, contact the Dean of Applied Sciences and Agriculture, University of Maine, Orono, Maine 04469.

ENVIRONMENTALLY RELATED OCCUPATIONS

Title	Education Level	Start Pay
Exterminator	High School	\$ 9,600
Fire Lookout *	High School	13,200
Fire Warden *	High School	15,600
Forest Worker *	High School	11,800
Forester Aide *	High School	13,200
Gamekeeper	High School	14,900
Radiation Monitor *	High School	20,700
Surveyor, Land *	High School	20,700
Tree Surgeon	High School	14,600
Water Treat. Plant Operator	High School	19,800
Engineering Technician	Associate's	18,400
Environ. Health Assistant	Associate's	18,900
Park Ranger	Associate's	15,800
Dairy Technologist **	Bachelor's	23,400
Ecologist, Forest **	Bachelor's	16,200
Engineer, Pollut. Control **	Bachelor's	21,900
Engineer, Sanitary **	Bachelor's	30,000
Entomologist **	Bachelor's	18,000
Forester **	Bachelor's	15,500
Haz. Waste Mgt. Specialist	Bachelor's	19,700
Hydrologist **	Bachelor's	19,800
Industrial Hygienist **	Bachelor's	28,700
Meteorologist **	Bachelor's	16,300
Microbiologist **	Bachelor's	21,000
Range Manager **	Bachelor's	15,600
Sanitarian **	Bachelor's	22,000
Scientist, Dairy **	Bachelor's	27,800
Scientist, Soil **	Bachelor's	21,400
Seismologist **	Bachelor's	24,400
Silviculturist **	Bachelor's	15,500
Biologist	Master's	26,600
Botanist	Master's	22,700

* Sometimes requires postsecondary training.

** Sometimes requires advanced degree.

Adapted from the GUIDANCE INFORMATION SYSTEM (GIS).

COLLEGE MAJORS AND SELECTED ENVIRONMENTAL CAREERS

AGRICULTURE AND NATURAL RESOURCES

Agronomist	Plant Breeder
Soil Conservationist	Soil Scientist
Dairy Scientist	Forest Ecologist
Park Naturalist	Forester
Silviculturist	Range Manager
Game Preserve Manger	Wildlife Control Agent

ARCHITECTURE & ENVIRONMENTAL DESIGN

Environmental Planner	Landscape Architect
Urban Planner	Site Planner

BIOLOGICAL SCIENCES

Biologist	Botanist
Soil Bacteriologist	Nematologist
Aquatic Biologist	Plant Ecologist

ENGINEERING

Geological Engineer	Wood Technologist
Environmental Researcher	

PHYSICAL SCIENCES

Air/Water Quality Analyst	Environmental Scientist
Meteorologist	Geologist
Hydrologist	Seismologist

Excerpted from the COLLEGE MAJOR OCCUPATION INDEX, McKnight Publishing Company.

STATE OF MAINE OCCUPATIONAL SUPPLY/DEMAND INFORMATION FOR ENVIRONMENTALLY RELATED CAREERS

The Microcomputer Occupational Information System for Vocational Program Planning (OIS) interfaces occupational supply and demand information so that planners can determine where they can best allocate State resources for training Maine people. The chart on the following page depicts OIS data for jobs relating to the environment.

There are five columns of information on the chart. The first contains the names of twelve occupations related to environmental careers. The second column presents occupational employment in Maine for each of these occupations for 1984 and projected to 1995. The number following "GR" in this column represents projected employment growth.

The third column contains supply data for the occupations. This is the number of individuals who completed a training or educational program in 1988 related to the occupation in the first column. In the fourth column, the SUP/DEM RATIO compares the annual numbers of completers and openings between 1984 and 1995. A figure higher than 1.0 in this column indicates that there were more completers than job openings, while a figure less than 1.0 indicates that there was a shortage of individuals to meet the anticipated job openings. Remember that the RATIO is only a comparison of supply to demand in Maine, and that many people completing programs that showed excess supply in Maine sought employment elsewhere.

Finally, the fifth column contains wage data for each occupation, either average Maine wages or national average starting salaries, whichever could be obtained. Those occupations for which only national data is available (drawn from Houghton Mifflin's Guidance Information System) are marked by an asterisk.

THE STATE OF MAINE OCCUPATIONAL INFORMATION SYSTEM: DATA FOR ENVIRONMENTALLY RELATED CAREERS

OCCUPATIONAL TITLE	EMPLOYMENT LEVEL	SUPPLY	SUP/DEM RATIO	SALARY
Chemist	84- 187 95- 270 GR- 30	50	6.25	\$27,087
Forest Conservation Worker	84- 126 95- 142 GR- 16	4	0.67	12,500
Fish and Game Warden	84- 152 95- 157 GR- 5	6	0.67	20,600
Meteorologist	84- 13 95- 13 GR- 0	0		16,300
Forester	84- 206 95- 215 GR- 9	64	4.57	15,500
Biologist	84- 282 95- 332 GR- 50	155	9.69	28,340
Geologist/ Geophysicist	84- 47 95- 62 GR- 15	19	19.00	26,100
Gardener/ Groundskeeper	84- 2,181 95- 2,659 GR- 478	43	0.20	9,755
Surveyor	84- 284 95- 389 GR- 105	1	0.07	21,154
Wastewater/Water Treatment Plant Operator	84- 484 95- 496 GR- 12	12	0.48	19,800
Civil Engineering Technician	84- 76 95- 131 GR- 55	16	2.43	18,400

ENTERING AN ENVIRONMENTALLY RELATED CAREER

In Section II you were introduced to a number of careers that deal with aspects of our environment. Were any of these occupations of interest? If so, continue, for we will explore personal characteristics that are typical of people who work in environmental careers.

John Holland, a nationally recognized career development theorist, defines six primary work environments:

- (1) Realistic
- (2) Investigative
- (3) Artistic
- (4) Social
- (5) Enterprising
- (6) Conventional

Holland asserts that people possess sets of common personality traits and move towards specific work settings that they find comfortable and meaningful for self expression. Of many environmental careers, the most common work environments are investigative and realistic. The checklist on the following page presents characteristics pertaining to these two work environments.

CHARACTERISTIC CHECKLIST FOR ENVIRONMENTAL OCCUPATIONS *

DIRECTIONS: Place an (X) by those items you believe describe you.

-
- | | |
|---|---|
| <input type="checkbox"/> Mechanical | <input type="checkbox"/> Open |
| <input type="checkbox"/> Dogmatic | <input type="checkbox"/> Academic Type |
| <input type="checkbox"/> Analytical | <input type="checkbox"/> Curious |
| <input type="checkbox"/> Scientific | <input type="checkbox"/> Broad Interests |
| <input type="checkbox"/> Quiet | <input type="checkbox"/> Reserved |
| <input type="checkbox"/> Highly Trained | <input type="checkbox"/> Thorough |
| <input type="checkbox"/> Ambitious | <input type="checkbox"/> Theoretical |
| <input type="checkbox"/> Math Ability | <input type="checkbox"/> Research Ability |
| <input type="checkbox"/> Tech. Competence | <input type="checkbox"/> Logical |
| <input type="checkbox"/> Inventive | <input type="checkbox"/> Self-Determination |

*Characteristics excerpted from Holland's 1987 *Manual Supplement* for the Self Directed Search.

Review your personal checklist. Do you have a sense that your expressed self knowledge somewhat matches the characteristics listed? If so, explore further! Take an interest inventory such as Holland's Self Directed Search or Harrington & O'Shea's Career Decision Making Inventory. Talk to your guidance counselor to see if you can set up any job shadowing opportunities that relate to environmental careers. Take a walk through the yellow pages and see if there are any firms that would have environmental careers. Now is your time to build the foundation for your future career path. Good fortune as you embark upon your journey.

CREDITS

This brochure was compiled by the staff of the Maine Occupational Information Coordinating Committee. Descriptive information was provided by the Departments of Environmental Protection and Agriculture. Additional information was contributed by International Paper Company. National occupational information was retrieved from Houghton Mifflin's Guidance Information System. State of Maine labor market information was developed by the Division of Economic Analysis and Research, Maine Department of Labor, and accessed through the Occupational Information System for Vocational Program Planning. Recognition is also given to John Holland, a career theorist whose work has greatly influenced career development programming throughout the United States and whose work has been adapted for inclusion in this publication.

More descriptive information can be obtained by accessing the Maine Career Information Delivery System or using the Maine Job Box which can be found in most guidance offices throughout Maine.

Maine Occupational Information Coordinating
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THINGS TO THINK ABOUT

- *How much education?*
- *Which high school courses?*
- *Any additional training or licenses?*
- *Where are the right schools?*
- *Opportunities for advancement?*
- *What are the working hours?*
- *Any areas of specialization?*
- *General starting salary or wage?*
- *Any extra benefits?*
- *Who might employ you for this job?*
- *What's the outlook?*

MAINE Works

ITV programs
and resource packets
are available for six
career areas.

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